

## **REMARKS**

It is respectfully submitted that the present response presents no new issues or new matter and places this case in condition for allowance. Reconsideration of the application in view of the following remarks is requested.

### **I. Status**

Applicants acknowledge with appreciation that the Examiner has entered the request for continued examination filed on 2/16/2011. Claims 1-10 and 14-20 have been considered.

### **II. The Rejection of Claims 1-4 and 14-20 under 35 U.S.C. 112, Second Paragraph**

Claims 1-4 and 14-20 stand rejected under 35 U.S.C. 112, second paragraph as allegedly being indefinite in reciting "and heating the dough". This rejection is respectfully traversed.

Applicants respectfully disagree with the Examiner's contention. Applicants respectfully submit that one of skill in the art, having general knowledge of the preparation of dough-based products in conjunction with Applicants' teachings in the specification, would appreciate that "heating the dough" is to be conducted for a time and temperature sufficient to achieve the desired dough-based product. Heating can be conducted, e.g., by baking or steaming, in order to achieve a baked product of a soft or a crisp character, either of a white, light or dark type of dough-based product. See, e.g., page 4, lines 5-10 as well as Example 3, which provides exemplary baking conditions for bread prepared according to the sponge and dough method.

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 112, second paragraph. Applicants respectfully request reconsideration and withdrawal of the rejection.

### **III. The Rejection of Claims 1-10 and 14-20 under 35 U.S.C. 103**

Claims 1-10 and 14-20 stand rejected under 35 U.S.C. 103 as being unpatentable over Schuster et al, USPN 6,254,903 ("R1") in view of Viet et al., Appl. Environ. Microbiol., 57:445-449 (1991) ("R2"). The Examiner cites R1 as disclosing a method of producing baked goods using enzymes leading to the prevention of staling, the application of maltogenic amylase in baking, adding the freshness-retaining enzyme in a quantity which is effective for prevention of staling, and that the freshness-retaining enzyme can be added on its own or along with other enzymes including xylanase. The Examiner cites R1 as teaching that the addition of xylanase with baking activity appears to be particularly effective in this connection. The Examiner concludes, therefore, that the recitation in claim 1 that "xylanase is added in an amount effective for increasing the shelf

life of the dough based product” would have been obvious to one of ordinary skill in the art. The Examiner acknowledges, however, that R1 is silent regarding use of the specific *Paenibacillus pabuli* xylanase in baking. The Examiner cites R2 as disclosing a xylanase from *Aeromonas caviae* W-61 (presently known as *Paenibacillus* sp. W-61) having 96.7% similarity with the claimed xylanase. The Examiner alleges that it would have been obvious to use the claimed xylanase and one of skill in the art would expect to observe the improvement in shelf life of baked products as disclosed by R1. This rejection is respectfully traversed.

Obviousness is a question of law based on underlying findings of fact. An analysis of obviousness must be based on several factual inquiries: (1) the scope and content of the prior art; (2) the differences between the prior art and the claims at issue; (3) the level of ordinary skill in the art at the time the invention was made; and (4) objective evidence of nonobviousness, if any. *Graham v. John Deere Co.*, 148 USPQ 459, 467 (1966). The teachings of a prior art reference are underlying factual questions in the obviousness inquiry. *Para-Ordnance Mfg., Inc. v. SGS Imp. Int'l, Inc.*, 37 USPQ2d 1237, 1240 (Fed. Cir. 1995). “[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR Int’l Co. v. Teleflex Inc.*, 82 USPQ2d 1385, 1396 quoting *In re Kahn*, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006).

The claims are directed to processes for preparing a dough-based product, comprising adding a xylanase to a dough, leavening, and heating the dough, wherein the xylanase is a polypeptide having at least 90% identity to the amino acid sequence as shown in positions 1-182 of SEQ ID NO: 2 or encoded by a nucleic acid sequence which hybridizes at 38°C in 0.1 x SSC with the complementary strand of nucleotides 85-630 of SEQ ID NO: 1, and wherein the xylanase is added in an amount effective for increasing the shelf-life of the dough-based product prepared from the dough.

The Examiner alleges essentially that, because the xylanase used according to the present claims was known, it would have been obvious to one of skill in the art to prepare the claimed xylanase, and clone it in host cells and culture hosts and recover enzymes to apply in baking. However, the Examiner has provided no articulated reasoning with some rational underpinning as to why it would allegedly have been obvious to one of ordinary skill in the art to do so with the *particular* xylanase according to Applicants’ claims, i.e., where the xylanase is a polypeptide having at least 90% identity to the amino acid sequence as shown in positions 1-182 of SEQ ID NO: 2 or encoded by a nucleic acid sequence which hybridizes at 38°C in 0.1 x SSC with the complementary strand of nucleotides 85-630 of SEQ ID NO: 1. Accordingly, the Examiner has not met his burden in establishing a *prima facie* case of obviousness.

Nevertheless, even assuming *arguendo* that the Examiner has established a *prima facie* case of obviousness (which Applicants do not concede to be the case), Applicants respectfully submit that the specification as filed demonstrates an improvement of the claimed invention over the prior art. For instance, Example 3 shows that the xylanase of the invention increases the amount of free water, which has been described in the literature to correlate to moistness of bread crumb, more than prior art xylanase. Moreover, Example 3 shows that the bread crumb made with xylanase of the invention together with a maltogenic alpha-amylase was perceived as more moist than bread made with the prior art xylanase and maltogenic alpha-amylase. The ranking of the sensory evaluation of softness and moistness on day 21 showed that bread crumb made with the xylanase of the invention together with Novamyl was perceived as more moist than bread made with prior-art xylanase and Novamyl.

The claimed processes require that the xylanase is added in an amount for increasing the shelf-life of the dough-based product prepared from the dough, which is also demonstrated by the present Examples. Example 3 further shows that the xylanase useful according to the invention shows improvements in both firmness and elasticity after 7 days, 14 days and 21 days. These results demonstrate that the xylanase of the invention together with Novamyl outperforms the combination of the prior-art xylanase and Novamyl.

Thus, Example 3 demonstrates the xylanase of the invention is effective in increasing the shelf-life of the dough-based product prepared from the dough, as demonstrated, e.g., by the results at day 21, and as required by the claims.

For the foregoing reasons, Applicants submit that the claims overcome this rejection under 35 U.S.C. 103. Applicants respectfully request reconsideration and withdrawal of the rejection.

#### **IV. Conclusion**

In view of the above, it is respectfully submitted that all claims are in condition for allowance. Early action to that end is respectfully requested. The Examiner is hereby invited to contact the undersigned by telephone if there are any questions concerning this amendment or application.

All required fees were charged to Novozymes North America, Inc.'s Deposit Account No. 50-1701 at the time of electronic filing. The USPTO is authorized to charge this Deposit Account should any additional fees be due.

Respectfully submitted,

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